Research Focus

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Transition cow management characteristics in Northeast dairy herds

Identifying key management strategies to reduce fresh cow disorders and improve overall performance.

Seventy-two large, commercial dairies, located in New York and Vermont participated in a field study to describe transition cow management strategies and herd performance characteristics. Analysis is ongoing to relate herd, facility, and nutritional management strategies to postcalving performance, reproduction, and health. This study was funded predominantly by the New York Farm Viability Institute with additional funding provided by Poulin Grain. Reported initial descriptive data represents annual data obtained from existing herd records during herd enrollment, responses to a herd management survey and observations during farm visits.

The average herd size of participating dairies was 935 milk cows (range: 345 to 2,900 cows), with a rolling herd average of 27,942 lbs and a herd annual average milk yield of 83 lbs/day. rbST was used in 40% of the study herds. Within herds using rbST, an average of 78% of eligible cows received rbST. Herd mean cull and death rates for first lactation (n=71) and all lactating animals (n=72) ≤ 30 DIM was 3.0 ± 1.6% and 7.2 ± 3.1%; ≤ 60 DIM was 5.7 ± 4.3% and 8.4 ± 4.3%; and overall was 20.5 ± 7.8% and 35.7 ± 7.1%, respectively. Farms (n=72) had an average stillborn rate of 5.9 ± 1.8% and twinning rate of 4.1 ± 1.4%. Incidence of herd identified post-partum health events (n=71) were as follows; retained placenta: 6.5 ± 3.8%, metritis ≤ 30 DIM: 6.4 ± 8.5%, displaced abomasum ≤ 60 DIM: 2.0 ± 1.6%, and ketosis ≤ 30 DIM: 6.6 ± 8.9%. Values for metritis and ketosis are likely underreported as not all farms recorded these disorders consistently.

Primiparous and multiparous animals had an average of 56 and 57 days dry, respectively. As parturition approached, 28% of herds moved animals to a maternity pen zero to three days before calving, while 72% of herds moved animals to a calving pen when the animals showed signs of calving. Eighteen percent of herds used separate calving locations for gravid heifers and mature cows. First lactation heifers and mature cows remained in the calving or maternity pen for the same amount of time after calving (3.9 ± 5.4 vs. 4.0 ± 5.6 hours). After calving, multiparous animals were moved to a pen and on average remained in that first pen for a longer period of time compared to primiparous animals (15 vs. 23 days). Primiparous and multiparous animals had an average voluntary waiting period of 58 and 59 days, respectively. The majority of farms (93.1%) implemented a hormone synchronization program for the first breeding, while the remaining herds relied on natural service or an electronic monitoring system to detect estrus. Herds detected estrus visually (70.8%); using an electronic system, such as activity monitors, rumination monitors, or pedometers (16.7%); and/or by using timed AI (93.1%). Many farms (65.3%) "cherry picked" cows before timed AI. The most popular synchronization program used was Presynch + Ovsynch (50%), followed by Ovsynch (26.4%), other (9.7%), and Double Ovsynch (6.8%).

Herds tended to commingle primiparous and multiparous animals more during the close-up (68.1%) and fresh (72.2%) periods compared to the far-off (34.7%) and high lactating (18.1%) periods. Animals were moved into pens housing close-up animals < 1 time/week (2.1%), 1 time/week (71.6%), or multiple times/week (25.3%). Commingling and moving animals into a close-up pen multiple times per week can increase negative social interactions, resulting in a more stressful environment, especially for primiparous animals.

The majority of farms (90.3%) used a two-group transition dry cow system (i.e. far-off and close-up pens), while only 9.7% of farms used a one-group dry cow system (i.e. one dry cow pen). Similar results were found during the early lactation period. Ninety-three percent of farms had a two-group transition system (i.e. fresh and high lactating pens), whereas 6.9% of farms used a one-group system (i.e. cows transitioned directly into a high lactating pen after calving). Interestingly, farms that used a two-group dry cow system did not always feed two different dry cow rations, similar to the early lactation period. Only 65.3% of herds fed two-dry cow rations (i.e. far-off and close-up diets), and 80.6% of herds fed two-early lactating rations (i.e. fresh and high lactating diets). More farms (77.8%) fed a commercial anionic supplement in the close-up diet than expected, which implies that anionic supplements are used in some herds feeding one dry cow ration.

As part of the study, a cohort of cows was selected during the first farm visit and was observed during the far-off, close-up, fresh and high lactating periods. Table 1 shows densities for stocking, water space, and feed bunk space, based on the number of cows

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rate of compost treatments showed lower N_2O emission per bushel of corn (Fig. 1A), whereas the highest N_2O emission per bushel of corn was found in the highest rate of manure and optimum N rate (100 lbs sidedress N/acre) (Fig. 1A). Every farmer knows that corn must have adequate N to produce good yields and it will be necessary to explain this to consumers. Since N_2O emissions increase as N inputs increase, it will be increasingly important for all corn producers to hone in on optimal N rates so that the highest corn yield can be obtained without creating any more N_2O emission than necessary.

Nitrous oxide emission per pounds of N credited

While we targeted expected peaks of emissions for measurement, literature indicates emissions taper quickly as free water drains from the soil, so the majority of total emissions should have been captured. When lower fertility levels were used, and lower yields resulted, the N_2O-N emissions per pound of N credited to the crop were actually higher (Fig. 1B). This indicates lower efficiency of use of the applied N, and also a result to avoid if possible. No matter the N fertilization rate, the N_2O-N emission losses we measured are agronomically small (Fig. 1B) and represent a very small fraction of the applied N: less than 5 to 10 lbs/acre. This means that N_2O-N emissions from corn production is not much of an economic issue for farms. However, with tens of millions of acres of corn produced annually in the US, the small emissions per acre can play a big role in contributing to GHG emissions, and are starting to get increasing attention in some circles. For farm managers, honing N management practices has always been good advice, and managing GHG emissions is one more reason to continue to do so. ❐

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present on each visit for the respective periods. Feeding frequency increased from the dry period to the lactating period (Table 1). Feed was pushed-up more frequently per day during the lactating period than the dry period (far-off: 7.2 ± 4.8×, close-up: 8.1 ± 4.2×, fresh: 8.4 ± 4.5×, high: 8.6 ± 4.6×). It was also more common to find dry cow pens with feed bunk walls (far-off visit: 15.6%, close-up visit: 16.5% of pens) than lactating pens (fresh visit: 8.1%, high visit: 4.2% of pens).

These results demonstrate the variability in current management practices and health related outcomes in large, progressive dairies in the Northeast and can be used for comparison and advisement purposes. Analysis is ongoing to identify associations that exist between these management factors and cow performance, including milk production, reproductive performance outcomes, health and culling, and energy metabolism and blood biomarkers. ❐

Table 1. Densities for stocking, water space, and feed bunk space, based on number of cows present on each visit in 72 herds (mean ± SD) and feeding frequency/day.

Item	Visit			
	Far-off (n pens)	Close-up (n pens)	Fresh (n pens)	High (n pens)
Stocking density (cows / stall), %	94.4 ± 21.4 (100)	92.7 ± 34.9 (79)	100.3 ± 22.5 (93)	116.6 ± 18.5 (211)
Bedded pack density, m2/cow	9.1 ± 7.1 (7)	12.3 ± 6.6 (17)	6.0 ± 5.5 (93)	–
Linear Water Space, cm/cow	6.7 ± 4.4 (107)	9.1 ± 6.2 (96)	10.3 ± 6.2 (98)	7.5 ± 3.0 (211)
Overall bunk density (cows/headlock spaces[1]), %	123.3 ± 41.4 (107)	96.4 ± 42.5 (96)	117.9 ± 37.2 (98)	153.0 ± 36.0 (211)
Feeding Frequency/day				
1×	91.7%	93.8%	68.7%	57.5%
2×	6.4%	5.2%	28.3%	35.1%
3×	-	-	-	1.4%
4×	-	-	3.0%	3.3%
Other	1.8%	1.0%	-	2.8%

[1] *Headlock spaces = (length of neck rail (cm) / 60.96 cm) or 1 headlock (1 headlock = 60.96 cm of neck rail space)*

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